Abstracts

EWS 3

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38P Physical protection of tomato crops against *Tomato chlorosis virus* and *Tomato yellow leaf curl virus*

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At present, whitefly-transmitted virus diseases constitute the most important limiting factor in the economical yield of tomato in South-eastern Spain. Murcia Region, in the southeast of Spain, represents the main fresh tomato growing area in this country where crops are grown traditionally in open air. However, economic losses due to the tomato viruses, mainly the whitefly-borne viruses, have promoted specific governmental credits to aid the growers to an amount of € 90 million for this region only, as well as several additional public initiatives. Therefore, crops are increasingly produced under plastic greenhouses, nets of different mesh size or a combination of both materials. Here we evaluated the effects of different greenhouse structures on the disease incidence caused by whitefly-vectored viruses.

Forty commercial greenhouses or nethouses featuring different covering structures and representative of those present in the Murcia region (south-eastern Spain) were monitored for virus disease incidence during 2003. The greenhouses were selected and classified based on their efficiency to prevent insect entry, particularly of aleurodids, according to literature and common observations by field agronomists in the Mediterranean area. Selected covers in greenhouses ranged from very low mesh nets to polycarbonate film. Structures were grouped into the following five categories: [1] nethouses with 6x6 threads/cm^2, equivalent to open air cultivation and with the only purpose of avoiding wind damages, [2] 6x6 threads/cm^2 nethouses covered with plastic film to reinforce structures, [3] 6x8 threads/cm^2 nethouses with plastic cover, [4] plastic-covered greenhouses with 10x16 threads/cm2 window screens, and [5] polycarbonate plastic greenhouses with 10x20 threads/cm^2 (50 mesh) window screens. *Bemisia tabaci*-transmitted virus disease incidence was evaluated by monitoring symptoms in plants and molecular hybridization of squash blots on nylon membranes, analysed with specific probes against ToCV, TICV, TYLCV and TYLCSV. Data of temporal disease incidence were used to determine the area under the disease progress curve (AUDPC). ANOVA was performed for each greenhouse cover type and Spearman's rank correlation coefficient was used to investigate the relationship between disease incidence (AUDPC) and greenhouse cover type. Alternatively, disease incidence data were used to construct disease progress curves and fitted monocyclic and polycyclic disease growth curve models.

For ToCV, the incidence correlated with the type of greenhouse cover, and was most reduced under higher-quality covers. Control of tomato yellow leaf curl disease (TYLCD) was achieved only for crops grown in the highest-quality greenhouses. TYLCD incidence in tolerant tomatoes remained below 100% within the five months of sampling, but disease progress rate at the initial stage of the cultivation was higher when compared with ToCV, which did eventually reach a 100% incidence in many greenhouses. Using linear regression analysis, the monomolecular model and the Gompertz model best described the development of ToCV and TYLCD, respectively, in most of the greenhouses. *Tomato infectious chlorosis virus* (TICV) was not detected in this survey, although it was described previously in the area.

Keywords: *Tomato chlorosis virus*, tomato yellow leaf curl disease, control.

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